

Claims

1. Apparatus that generates and supplies fluorine gas and is disposed in the gas supply system of a semiconductor processing system, said apparatus being
5 characteristically provided with
an electrolytic cell that generates fluorine gas by the electrolysis of hydrogen fluoride in
an electrolytic bath comprising hydrogen fluoride-containing molten salt,
a cylinder that stores a substitute gas selected from the group consisting of nitrogen
fluoride, sulfur fluoride, and chlorine fluoride,
10 a gas switching section that is connected to the electrolytic cell and cylinder and that
selectively supplies a gas utilization section with fluorine gas from the electrolytic
cell or substitute gas from the cylinder,
an electrolytic cell detector that detects the state of the electrolytic cell, and
a controller that, upon detection of an abnormal state at the electrolytic cell by the
15 electrolytic cell detector, exercises control on the gas switching section so as to
feed the substitute gas from the cylinder to the gas utilization section.
2. The apparatus of claim 1 for the generation and supply of fluorine gas,
characterized in that the electrolytic cell detector detects a state that is representative of
20 the composition of the electrolytic bath.
3. The apparatus of claim 2 for the generation and supply of fluorine gas,
characterized in that the electrolytic cell detector detects a state selected from the
electrical current characteristics, liquid level, and temperature of the electrolytic bath.
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4. Apparatus according to any of claims 1 to 3 for the generation and supply of
fluorine gas, characterized in that the apparatus is additionally provided with a path
detector that can detect an abnormal state in the gas supply path that supplies fluorine
gas from the electrolytic cell to the gas utilization section and in that the controller, upon
30 detection of an abnormal state at the electrolytic cell by the electrolytic cell detector or
upon detection of an abnormal state in the gas supply path by the path detector,

exercises control on the gas switching section so as to feed the substitute gas from the cylinder to the gas utilization section.

5 5. Apparatus that generates and supplies fluorine gas and is disposed in the gas
supply system of a semiconductor processing system, said apparatus being
characteristically provided with
an electrolytic cell that generates fluorine gas by the electrolysis of hydrogen fluoride in
an electrolytic bath comprising hydrogen fluoride-containing molten salt,
a cylinder that stores a substitute gas selected from the group consisting of nitrogen
10 fluoride, sulfur fluoride, and chlorine fluoride,
a gas switching section that is connected to the electrolytic cell and cylinder and that
selectively supplies a gas utilization section with fluorine gas from the electrolytic
cell or substitute gas from the cylinder,
a path detector that can detect an abnormal state in the gas supply path that supplies
15 fluorine gas from the electrolytic cell to the gas utilization section, and
a controller that, upon detection of an abnormal state in the gas supply path by the path
detector, exercises control on the gas switching section so as to feed the
substitute gas from the cylinder to the gas utilization section.

20 6. The apparatus according to claim 4 or 5 for the generation and supply of
fluorine gas, characterized in that the gas supply path is provided with a buffer section
that controls the pressure and flow rate of the fluorine gas that is supplied from the
electrolytic cell to the gas switching section and in that the path detector is provided
with a buffer detector that detects the state of the buffer section.

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7. The apparatus according to claim 6 for the generation and supply of fluorine
gas, characterized in that the buffer section is provided with a compressor that
pressurizes the fluorine gas from the electrolytic cell and in that the buffer detector
detects the operational status of the compressor.

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8. The apparatus according to claim 6 for the generation and supply of fluorine gas, characterized in that the buffer section is provided with a buffer tank that temporarily stores fluorine gas from the electrolytic cell and in that the buffer detector detects the pressure within the buffer tank.

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9. The apparatus according to claim 6 for the generation and supply of fluorine gas, characterized in that the buffer section is provided with a flow controller that supplies fluorine gas from the electrolytic cell to the gas switching section at a specified flow rate and in that the buffer detector detects the fluorine gas flow rate at said flow controller.

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10. Apparatus according to any of claims 1 through 9 for the generation and supply of fluorine gas, characterized in that the substitute gas comprises chlorine fluoride.